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PRELIMINARY REVIEW AND SYNTHESIS OF ARCHIVAL SOURCES CONCERNING FIRE USE AND MANAGEMENT PRACTICES AMONG HISTORIC SOUTHWESTERN ANGLO-AMERICAN, HISPANIC, AND AMERICAN INDIAN COMMUNITIES

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PRELIMINARY REPORT

Submitted by
Thomas Merlan, Cooperator

to

Rocky Mountain Research Station, USDA Forest Service, Albuquerque, New Mexico

November 30, 2003

RMRS Library
USDA Forest Service
SEP 17 2004
240 W Prospect Rd
Fort Collins CO 80526

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BACKGROUND AND PROJECT PURPOSE

This project is the archival subsection of a larger project designed to evaluate community values, beliefs, attitudes, practices, and preferences concerning the historic use of prescribed fire as a vegetation management tool in grassland, forest, and woodland ecosystems in New Mexico and Arizona and the extreme western portions of the Texas and Oklahoma Panhandles.

This project has been carried out under the general direction of the Cultural Heritage Research program, Rocky Mountain Research Station, United States Forest Service ("Cultural Heritage Research").

This project consists in review and synthesis of *unpublished, archival information* on historic fire use management practices among Anglo, Hispanic, and American Indian communities in Arizona and New Mexico and the extreme western portions of the Texas and Oklahoma Panhandles in the area of the Kiowa and Rita Blanca National Grasslands. The materials that have been reviewed include manuscripts, archives, and historic photographs.

Several published references of special significance are discussed below, and a select bibliography of important published references is also included. In general, however, since the purpose of this project is to deal only with archival sources, published references are excluded.

This synthesis deals with prehistoric and historic times up to c. 1891 (the inception of modern forest management in the United States through the authorization of forest reserves under the General Land Law Revision Act, a.k.a. Creative Act of 1891).

This interim report identifies and describes archival sources consulted to date. Where relevant citations are given, they are placed between lines for easy reference.

This report presents information in a descending order: **state**, *location* (i.e., institution), archive, collection and *citation*. Online addresses are also given.

PROJECT METHOD

I identified major archival and manuscript collections in the study area or relating to the study area. I searched collections online to the extent possible (searches were facilitated by collection descriptions and contents lists searchable by keyword[s]). I then visited archives and collections in Colorado, New Mexico, Oklahoma, and the Washington D.C. area. The discussion below will note online searches and actual visits to archives.

PREVIOUS RESEARCH UNDER THIS PROJECT

The review of published sources undertaken within this project is summarized in Condie and Raish (Condie and Raish 2003). This report reviews published historic, ethnographic, and archaeological sources having to do with the use of managed fire by groups in the region of study. Dr. Condie examined between 400 and 500 sources. The fire uses identified included (1) clearing land and agricultural fields and pastures, (2) replenishing soil nutrients in agricultural fields, (3) killing woody species in rangelands, (4) encouraging grass growth, (5) increasing wild seed production, (6) stimulating shoot formation, (7) improving growth of both wild and cultivated tobacco, (8) driving and hunting game, and (9) waging war (see Condie and Raish 2003, table 1).

PUBLISHED SOURCES

As noted above, this project has been a review and synthesis of *unpublished, archival* *information* on historic fire use management practices. Select major published sources are also cited in the bibliography below.

Several of these published sources merit special mention. The most important is *Forgotten Fires* (Stewart 2002), and in particular the brief section on the Southwest (pp. 218–224). Stewart completed his manuscript in 1954; for various reasons, it remained unpublished for almost fifty years. Stewart had contributed to the culture element distribution studies conducted by the University of California, Berkeley (see Stewart 1942). In *Forgotten Fires,* Stewart cites this study of the Ute-Southern Paiute, as well as Drucker (1942, Yuman-Piman), Gifford (1941, Apache-Pueblo), Gifford (1936, Northeastern and Western Yavapai), and Hill (1938, Navajo). Further, he cites Beaglehole (1936, Hopi) and Spier (1928, Havasupai), published among the Yale University Publications in Anthropology.

Drucker (1942), Hill (1938), and Stewart (1942) are cited in Condie and Raish (2003).

Stewart notes hunting (Apache, Havasupai, Navajo, Papago, Pueblo, Yavapai, Yuman-Piman) and the burning of seed-gathering areas to improve the yield of wild seeds (Cocopa, Papago, Pueblo) as principal traditional uses of fire in the study area.

Bahre (1985) summarizes accounts of fire and wildfire in nineteen newspapers published in southeastern Arizona in the period 1859–1890. Thirty-three major fires were reported for the period, but Bahre notes that "generally, only wildfires that could be seen from Tucson or Tombstone or that were extremely large or threatened personal property were recorded" (Bahre 1985:191). The *Tucson Daily Record* for May 15, 1880, attributes wildfires to "the carelessness of campers" (Bahre 1985:192). The *Record* refers again on June 4, 1880, to "careless prospectors" (ibid.). The *Arizona Daily Star* for May 21, 1882, attributes "immense fires . . . in some parts of western New Mexico and southern Arizona" to Indians. Bahre agrees (Bahre 1985:192–193) that Apaches set fires, but concludes that whites exaggerated the number of fires attributable to Indians. He suggests that some fires were human-caused accidents, some were set by Apaches for a specific purpose—e.g., to create rain (or so white editors believed) or as a military tactic—and some were natural.

Although unpublished, an important Master's thesis should also be mentioned here. J. Mark Kaib summarizes 210 cultural fire citations in the Southwest borderlands (including northern Chihuahua and Sonora) from the 1600s to late 1800s (Kaib 1998:175–211). Some of these are not in fact references to fire, but have to do more generally with Indian subsistence and military tactics. Most of the sources are published. Many of these references do not offer any cause for the fire being reported; others specify that the fire was a human-caused accident. A lesser number of references specify that a fire was deliberately set by humans. Most of these fires are described as signal fires or cooking fires. The use of fire as a tactic in war by Indians (and sometimes by Mexican troops) is also cited. There are several descriptions of use of fire in hunting, some descriptions of cremation, and a specific reference (Wheeler) to burning by Indians to promote growth of forage (Kaib 1998:210).

ARIZONA

Arizona Archives Online

In the spring of 2003 the University of Arizona, Northern Arizona University, and Arizona State University began contributing to a database called "Arizona Archives Online" or AAO. This is modeled on the OANM or "Online Archives of New Mexico." Abstracts of manuscript collections are being entered in this database daily. At this writing, the AAO contains descriptions and contents lists for about 100 archival and manuscript collections housed at Arizona State University, over 50 collections housed at the University of Arizona, and over 100 collections housed at Northern Arizona University. These include the "Arizona Collection" at Arizona State University, which contains various references to environmental history, and the "Fire on the Plateau Collection" at Northern Arizona University, which deals in detail with fire history and fire management on the Colorado Plateau (see under Northern Arizona University below).

See: http://ead.lib.asu.edu

University of Arizona Library

University of Arizona Library
Special Collections
P.O. Box 210055
Tucson, Arizona 87521
(520) 626-8717

Shan Sutton, Archivist
SuttonS@u.library.arizona.edu

See also: http://www.library.arizona.edu/branches/spc/homepage/, the homepage of the University of Arizona Special Collections.

The University of Arizona Library Special Collections houses manuscript collections with emphasis on the history and literature of Arizona and the Southwest borderlands. These collections may be searched on the SABIO database and are now being placed on AAO.

I searched these collections online and corresponded with staff I did not visit the University of Arizona.

Arizona State Museum

Arizona State Museum
University of Arizona
P.O. Box 210026
Tucson, Arizona 87521-0026
(520) 621-6302

Contact: Alan Ferg
ferg@email.arizona.edu

I searched these collections online and corresponded with staff. I did not visit the Arizona State Museum.

Sound Recording Collection

There is no recent finding index to this collection; the index in use was compiled in May 1987 by Kirsten Tedesco. It may be key-word searched in-house only. This finding aid may be placed online within the next year or so, but the Arizona State Museum first proposes a consultation process with a number of tribes (Alan Ferg, pers. comm. 2003). The indexing is rather general and does not include the word "fire." I have not discovered any references to fire use or response to fire in this collection. See *Further Research* below.

Documentary Relations of the Southwest

The DRSW is a computerized guide to several collections of Spanish colonial documents:

Provincias Internas, Archivo General de la Nación (Mexico City);
Spanish Archives of New Mexico, Series II (Santa Fe, New Mexico)
The Bexar Archives (to 1790) (University of Texas, Austin, Texas)
The Archivo de Parral (Parral, Chihuahua)
Various other documents from European and Mexican archives.

The collection spans the Spanish colonial period, 1520–1820. The computerized database includes a master bibliography and indices of the named collections, as well as a *Biofile Southwest* listing 19,864 persons living in the greater Southwest during the Spanish colonial period who appear frequently in the historical record of northern New Spain.

The online address for Documentary Relations of the Southwest is http://www.statemuseum.arizona.edu/drsw/drswtool.shtml

The database contains few and indirect references to land modification by fire. There are approximately 31 references to fire including house fires and firearms. There are several references to the use of smoke signals.

Note: All indexed references in the database have serial numbers.

Documentary Relations of the Southwest: Citations

On January 12, 1769, Domingo Elizondo writes to the Marques de Croix, discussing a plan to burn a rebel rancheria and a bosque where Indian rebels are hiding. [Provincias Internas, Vol. 226 FF. 01-05 approx. Serial No. 041-04880]

On March 20, 1770, following up this proposal to drive Indian rebels out of a stronghold by setting fire, Domingo Elizondo advises the Marques de Croix that this is a dubious tactic, since the rebel Indians might retaliate in kind, and burning would destroy every pasture on which Spanish horses depend. [Provincias Internas, Vol. 226, FF. 208-209 approx. Serial No. 041-14927]

The Biofile includes the name of Antonio Comaduran, born in 1797 in Arispe, Sonora, who served in the Fourth Flying Company in Del Norte and in Tucson.

Documentary Relations of the Southwest does not include Comaduran's 1830 campaign report. This is cited in Dobyns (1981).

Comaduran Report (1830): Citations

Captain Antonio Comaduran of the presidio of Tucson reports that he saw Apaches burning pasturage (probably to drive game) on May 29, 1830, between Arivaipa Canyon and the Gila River, northeast of modern Tucson.

"May 29. At day break, I began the march toward the north, and around 9 o'clock I arrived at the Canyon of the Agua Escondida de los Ynfantes . . . After having marched about seven leagues, the scouts who traveled on the point saw three Indians who came along the heights of the Sierra . . . After the enemy escaped from the infantry, we managed despite many cuts to the horses from the bad ground to kill one warrior. The other escaped by climbing to the summit of the Sierra. This Indian escaped very badly wounded . . . The other who came burning the pasturage fled through the Sierra . . ." [Archivo General de la Nación, Casa Amarilla, Indiferente, Legajo 225. Cited in Dobyns (1981:22)]

Northern Arizona University

Special Collections and Archives Department
Cline Library
Northern Arizona University
S. San Francisco Street
Flagstaff, Arizona 86011
(888) 667-3628

See the online archive of manuscript collections at www.nau.edu/library/speccoll/manuscripts.htm

I searched these collections online and corresponded with staff. I did not visit Northern Arizona University.

Day Family Collection, 1858-1977. Collection Number NAU.MS.89. [Cline Library, Special Collections and Archives Department, Northern Arizona University]

The Day Family were Anglo-Indian traders, on the Navajo Reservation in eastern Arizona. The collection includes the personal and business papers of Sam Day, Sr. (1845-

1925) surveyor, Indian trader, legislator, and United States Indian Commissioner; Anna Day, Sam Sr.'s wife (1872-1932); and of their children, Charles L. Day (1879-1918), Samuel Day, Jr. (1889-1944), United States Deputy Marshall.

This collection contains some of the earliest dates in the collections of Northern Arizona University.

There are only five specific references to fire in the Day Family Collection. Series 1, Box 2, Folder 34 contains correspondence c. 1924 about the enforcement of fire law on the Forest Reserve. Series 3, Box 1, Folder 13 contains correspondence about a forest fire plan (1910). Series 3, Box 3, Folder 17 contains a 1934 fire report. Series 3, Box 3, Folder 28 is a 1935 fire duty schedule. Series 5, Box 1, Folder 46 discusses loss of valuables in a 1906 fire.

Joseph Bean and Laura Tappan Collection 1835–1949. Collection Numbers NAU.MS.218 and NAU.PH.660. [Cline Library, Special Collections and Archives Department, Northern Arizona University]

The Joseph Bean and Laura Tappan collection consists of correspondence, pictures, and other papers of Joseph Bean Tappan (1858–1933) of Flagstaff, Arizona, which relate to his activities as a sheep rancher and as mine developer in La Paz County, Arizona, to his battles over water rights, and to his family in Gilmanton, New Hampshire. It also includes correspondence, pictures, and other papers of Tappan's wife, Laura Fulton Tappan (1849–1933).

This relatively early collection contains no specific references to fire.

Fire on the Plateau Collection. Collection Numbers NAU.MS.339 and NAU.OH.97. [Cline Library, Special Collections and Archives Department, Northern Arizona University]

The Fire on the Plateau Collection includes newspaper and internet articles, documents, and working files pertaining to fires and fire prevention on the Colorado Plateau. The collection also includes oral history interviews and field videotapes. These are recent materials.

I also reviewed indices and content lists for all of the following in the Cline Library of Northern Arizona University:

Fred Harvey Company Collection, 1900–1986

Lauzon Family Collection, 1885–1982

Platt Cline Collection, 1884–1983

Riordan Family Collection, 1883–1931

Various references to fire and to National Forests postdate 1900.

Photo Archive
Special Collections and Archives Department
Cline Library
Northern Arizona University
S. San Francisco Street
Flagstaff, Arizona 86011
(888) 667-3628
www.nau.edu/library/speccoll/guide/guide.html

The Special Collections and Archives Department houses over 700,000 photographic images. A guide is available at the above address. I did not locate any images of wildland or rural fire dating before1890.

Arizona State University

University Libraries
Department of Archives and Manuscripts
Arizona State University
P.O. Box 871006
Tempe, Arizona 85287-1006

Contact: Marilyn Wurzburger, Special Collections Librarian
www.marilyn.wurzburger@asu.edu

I searched these collections online with staff assistance. I did not visit Arizona State University.

I reviewed indices and content lists for several collections at Arizona State University. These are within the Arizona Collection referenced above.

http://www.asu.edu/lib/archives/arizona.htm

I checked indices and content lists for:

Martin D. Flohr Collection, 1895–1965

William J. and Laura Fulwiler Murphy Collection, 1781–1983

Folklore Archives, 1977–

Various references to fire and to National Forests postdate 1900.

OKLAHOMA

University of Oklahoma at Norman

The University of Oklahoma
Monnet Hall, Room 452
630 Parrington Oval
Norman, Oklahoma 73019
(405) 325-1641

Western History Collections, University of Oklahoma Libraries
http://libraries.ou.edu/depts/westhistory/Intro/

I searched these collections online and then visited the collections (detailed finding aids are available on site but are not available online).

The photographic and manuscript archives are summarized in:

Southwell, Kristina L. (comp.)
2002 *Guide to Photographs in the Western History Collections of the University of Oklahoma.* Norman: University of Oklahoma Press.
2002 *Guide to Manuscripts in the Western History Collections of the University of Oklahoma.* Norman: University of Oklahoma Press.

The Photographic Archive contains about 841,000 images of frontier photographers, Indians, ranches and ranching, and many related subjects. 661 collections are listed in Southwell.

I reviewed all collection descriptions and then read the unpublished finding aid for each of the following:

Walter Stanley Campbell Collection (90)

Edward Everett Dale Collection (153)

Leslie Hewes Papers (622). These research notes deal with geography, agriculture, Indian settlement by allotment, fencing, irrigation.

Indian Pioneer Papers Collection (696). Interviews collected in the 1930s by government workers regarding settlement of Oklahoma and the Indian territories, conditions and conduct of life. 80,000 entries may be accessed by personal name, place name, or subject.

Irene Eldridge Mitchell Collection (422)

Oklahoma Geological Survey (464) and Oklahoma Geological Survey Collection (1036). This state geological survey contains correspondence, geological reports, field notes.

Frank Phillips Collection (494)

Seminole Nation Museum Collection (539)

William Merrit Taylor Collection (583)

D. C. Ward photographs (623)

Firefighters are pictured in the Paul Frame photographs 1890–1934 (220), the Dick Jordan photographs, c. 1900–1920 (332), the Jordan Studio Collection 1896–1910 (334), the William Miller photographs 1900–1925 (419), the Moore Public Library Collection 1900–1925 (429), the Irvin Munn photographs 1890–1940 (438), and the Stephens County Historical Museum Collection photographs 1880–1980 (572). I found no images of wildland or rural fire.

The Manuscripts Division holds some 11,000 feet of primary textual materials, 5,200 maps, 1,500 sound recordings, 800 posters, and about 1,000 series of microforms. 1,535 collections are listed in Southwell (2002). Materials include diaries, journals, literary manuscripts, business and personal correspondence, business records, scrapbooks, broadsides, posters, sound recordings, and maps.

I reviewed Southwell's descriptions of collections (both photographs and manuscripts) that I had previously identified using the keyword "fire." These included the Doris Cornell Papers; the Madeline Czarina Colbert Conlan Collection; the John Berlin Fink Photograph Collection (1886–1950); the Ralph Hudson Photoprints (1915); the Leon Ciereszko Collection; the Emma Sewell Photoprints (1910–1912); the Errett Rains Newby Photograph Collection; the McAlester Chamber of Commerce Photoprints

(1905–1950); the W. H. Lininger Collection; the William Hollis Photoprints (1901–1919); the Moore Public Library Photoprints (1900–1925); the William Miller Photoprints (1900–1925); the Airlie Ernest Carlock Collection; the Shawnee Public Library Photoprints (1896–1928); the Jordan Studio Photoprints (1896–1910); the Evelyn Hughes Shumard Photograph Collection; the Norman Public Library Photoprints (1893–1919); the Woodward County Photoprints (1893–1915); the Corn Historical Society Photoprints (1890–1977); the Irvin Munn Photoprints (1890–1940); the Paul Frame Photoprints (1890–1934); the W. H. Butcher Photoprints (1890–1930); the Emma Albert White Coleman Photograph Collection (1890–1915); the Foress B. Lillie Photograph Collection (1889–1920); the Robert L. Cunningham Photograph Collection (1880–1930); the Waddie Hudson Photograph Collection (1880–1900); the Mary Louise Ligon Photograph Collection (1880–1920); the Benjamin R. Cook Collection (1872–1948); and the Edwin C. DeBarr Collection (1870–1950).

Box 1, Folder 62 in the William E. Bittle Collection (Kiowa-Apache materials) is labeled "fire." These are transcriptions of remarks on making fire, types of wood, etc. These interviews spanned 1949–1965.

There is a looseleaf finding aid for newspapers by name and dates, but no subject index.

Maps are indexed. The Sanborn Fire Insurance maps of cities and towns in Oklahoma and Indian Territory are in a separate section of the index. The general or first section of the index is a guide to maps in five general categories: geographical area, place name, map type (novelty, treasure, topographical etc), subject (agriculture, slavery), and publisher (or cartographer, surveyor, creating agency, or distributor).

Each map has a dual numerical designation, such as 5-20. The first number is the collection, the second is a description, with limits, date if any, publisher, and general description.

I checked all entries for maps of Cimarron County, Oklahoma. These include highway maps, a map of the Santa Fe Trail, and a map that includes bodies of water.

The map of "Colton's Indian Territory" published by G. W. and C. B. Colton and Company, William Street, New York, is numbered No. 172 and is "drawn from maps and surveys furnished by the Engineer Bureau, War Department, U.S." n.d., c. 1867. This shows the Cherokee country or strip (northern Oklahoma, including the Kiowa Grasslands). "Camp Nichols" on the Cimarron is the only settlement shown.

Doris Duke American Indian Oral History Transcript Collection

This oral history transcript collection is in the Western History Collections of the University of Oklahoma. Between 1967 and 1972 this project collected interviews from representatives of every American Indian group in Oklahoma. Interviews were transcribed, copied on microfiche cards, and made available to other libraries.

There are various references to ceremonial use of fire and to destruction of buildings and houses by fire. There are also descriptions of prairie fires.

Jess Rowlodge, Arapaho (b. 1884), was interviewed in 1968. In an interview of April 4, 1968, he describes how fires might begin accidentally, and how cowboys fought fires (he is speaking of the Canton vicinity, east of our study area. However, his statements illustrate fire hazard and methods of fighting fire in the grasslands).

Sam Hazous, Fort Sill Apache (b. 1864 approx.), was interviewed by members of his own family (the tape was subsequently loaned to the American Indian Institute and was copied for the Oral History Project). He describes the use of fire by Mexican troops against Apaches as a technique in war. His reminiscences have to do with southwestern New Mexico and northern Mexico.

Several interviews are of general interest because they describe responses to prairie fire, although they are not within the area of study.

Ben Henry, Cherokee, born c. 1888, was interviewed in 1969. In an interview of April 16, 1969, he describes making rails to replace fences burned by prairie fire in Rogers County. This is in the Washington vicinity south of Oklahoma City.

George Barker, Delaware, born in 1881, was interviewed in 1969. He lived in the Welch vicinity in far northeast Oklahoma. In an interview of January 15, 1969, he describes the general fear of prairie fire in "the early days" (the 1880s and 1890s) and how settlers would have to vacate an area when a fire broke out because it was often impossible to predict the direction of the wind and accordingly the direction of the fire.

Scott Secondine, Shawnee, born in 1891, was interviewed on January 20, 1969. He describes prairie fires in the White Oak vicinity in Craig County (Shawnee Hills of far northeast Oklahoma) and how a boy he knew died (possibly of heat exhaustion) while trying to put out a burning fencepost, ignited by a prairie fire, with fresh dirt that he scraped up by hand.

Doris Duke American Indian Oral History Collection, University of Oklahoma: Citations

"(Were those fires set on purpose?)

[Jess Rowlodge responds] Not on purpose. Sometimes maybe a cowboy's on the range land and throws a match down or a cigarette or something. They had nothing but Durham cigarettes and I still smoke them. And it would cause a wide, long fire to just blaze, and it was three or four miles in some places. It would maybe make the grass short for the cattle in the fall . . . When you get down in the bottom where there's a slough, there's tall thick grass—we used to go out there and watch them long, tall, blaze, you know. Hear the crackle. That's that slough grass. Rabbits, coons, and skunks and possums, birds, you see them.

Did those prairie fires ever cause any danger or do any harm to Indian camps?

Well, my home burned up when we was away. Right north of Geary—a two-room fine lumber house. Prairie afire up in the north, and nobody was there and it burned our home down. . .

(Was there any way that people could fight those prairie fires?)

Well, the cowboys had a way. I know one instance over here southeast—19 miles—east of where Agnes lived—they was all camped there at the old twelve-mile point—they was camped there. And the cowboys had sold—when they killed one of their own beeves for their own use for their chuck wagon—and the other one was sold to an outfit that came through there. A young beef. Well, they didn't care to take the hide. But the way the cowboys would do, they'd tie a rope to the hide to the saddle horn, and they'd run ahead of that fire, you know. Just lay the grass down. Sometimes they're right at the edge of the fire, and they extinguish that fire, long ways. That's the only way they fought fire.

(Did they have those kinds of fires even in the days before the cowboys got here—way back?)

Once in a great while. You know the Indians always camped together when they stopped, they camp. They was always camping. And sometimes the boys would start a fire by trying to burn a tree down with an animal in it—something like a squirrel or coon or something like that. And it would get out—it goes through the timber and then goes out on the open prairie. And it was on fire. The last damage I remember was about 1904 . . . the Indians had been at the Agency. And for some reason they had to camp along the river two or three days. Tall slough grass. Sitting Bull and Heap of Crows—I remember those two older men were in that camp. Somehow a fire started north of them—about a quarter of a mile. And they couldn't control that fire. It was too heavy. It burned their tipis. Their wagons. They lost practically everything. That's the last one I know of." [Doris Duke American Indian Oral History Collection, University of Oklahoma. T-236, Fiches 28–29, pp. 20–21; 4-4-68]

[Sam Hazous talks about events on the "Warm Springs Reservation"—that is at Ojo Caliente, near the modern community of Dusty in the southwest corner of Socorro County, New Mexico, of the escape of the Apaches from the reservation and an encounter with Mexican soldiers] "So they [Mexican troops] just that way by sun down, why they put the fire around it—prairie fire—so nobody want to get out. They watch it, these Apache they watching, when some of them crawls around there in the grass, when the fire kind of died down in some places—why they go through there. They crawl through there. They finally, older man and woman they got out of there." [Doris Duke American Indian Oral History Collection, University of Oklahoma. T 194, Fiche 179, p. 7, 1956]

Western History Collections Photographic Archives, University of Oklahoma Libraries

http://libraries.ou.edu/depts/westhistory/Intro/overview.html

This archive holds over 250,000 prints and negatives, with emphasis on the American Southwest and West for the period 1870–1940.

This archive may be searched by subject. Fire, wildfire, and forest are not subject headings. I have not located any images of wildland or rural fire pre-1890.

NEW MEXICO

Online Archives of New Mexico

Several major New Mexico collections are indexed online in the Online Archives of New Mexico. The collections housed in the Center for Southwest Research, University of New Mexico (Albuquerque) as well as those in the History Library of the Museum of New Mexico (Santa Fe), the Rio Grande Historical Collections (New Mexico State University, Las Cruces) and the New Mexico State Records Center and Archives (Santa Fe) are indexed online at this address.

http://elibrary.unm.edu/oanm

I searched these collections online and then visited the Center for Southwest Research.

University of New Mexico, Albuquerque

Center for Southwest Research
Zimmerman Library, Room 222
Albuquerque, New Mexico 87131-1466
(505) 277-6451

Doris Duke American Indian Oral History Collection, Center for Southwest Research

The Duke Project collected interviews from Pueblo, Navajo, and Apache informants in the period 1967–1972 (there are also some recordings of informants from other tribes elsewhere in the United States). There are 901 recordings; most have been transcribed. The collection is stored in 70 boxes under collection number MSS 314 BC.

There are few references to use of fire.

Doris Duke American Indian Oral History Collection (New Mexico): Citations

San Juan Pueblo Tape 13 (August 8, 1968) is an interview with a San Juan man who describes the use of fire in agriculture. He states that San Juan farmers burn weeds in March before cleaning the ditches.

"Well, in March they start to work out in the farms. They start to burn, the weeds getting ready to you know, to plant the crops...some of the...well they burn the weeds and they rake it up...and...Well, they rise it up first and they pile it up and burn it up. And they start plowing." (p. 5)

The informant says that this used to be the work of old men "that are still able to get around...and they're the ones that burn the...dried up weeds and if there's some willow or some tree obstructing the ditch...the old men just take care of that" (p. 6).

Tape 73 (Side 1) is an interview of Juan A. Jaramillo of Isleta Pueblo by Michael Husband and Donald Cutter on January 27, 1969.

Jaramillo states that the farmers burn the weeds in March.

Now is the time to burn the weeds...now anytime from now on...you can burn those weeds...and then like I think in March that is the time when you start to clean them off...when it needs to be clean, you think [sic] them off on the top...if it doesn't need it, why..." (p. 18).

Caprock Oral History Project, Center for Southwest Research (MSS 637 BC)

Each interview has an index of keywords that facilitates review. Other than references to obtaining fuelwood from the "breaks" or edge of the caprock, and use of cow chips for fuel, there is no discussion of fire.

Alamo Navajo Oral History Project: MSS 563 BC

I found no references to fire in this collection.

Cundiyo Fieldwork Collection: MSS 652 BC

I found no references to fire in this collection.

NMEH South Valley Oral History Project: MSS 636 BC

This is an urban study. There are no references to natural or cultural fire.

East Mountain Oral History Project: MSS 597 BC

I found no references to fire in this collection.

North Valley Oral History Project: MSS 572 BC

I found no references to fire in this collection.

Pioneers Foundation Oral History Collection: MSS 123 BC

This collection (MSS 123) consists mainly of the interviews conducted by newspaperman Lou Blachly in the early 1950s. He spoke to early settlers (that is, individuals whose memories of the region went back to c. 1885) in western New Mexico and southern Arizona.

His interview of Marietta Wetherill, widow of trader and avocational anthropologist Richard Wetherill, contains her description of a prairie fire.

Pioneers Foundation Oral History Collection: Citation

"I heard people couldn't get away from them [prairie fires] and I laughed to myself, I though why that's silly a fire don't go that fast. But as we were coming on the road between Dodge City and wherever we came, you know, as we were coming on the first trip of exploration [to New Mexico] we saw a prairie fire. It was going away from us but it actually went faster than a horse, a man on a horse, could run. The wind was pretty brisk you know...it was horrifying and unbelievable and that was just in buffalo grass. But of course the buffalo grass was dry and high and it just whizzed right over the country like a flash almost...you could dig down that deep through that [buffalo] grass...Just like a mattress...I think it [the fire] was just about half a mile [wide]. It went right across this...pasture and that was what the man was doing, see, he was running to get ahead of it and gather up some cattle that was down in the far corner and bring 'em out this way to over where it had quit burning and you see all those buffalo chips all over the country those would get afire and then they'd smolder for days." [Tape No. 433, p. 4]

Museum of New Mexico, Santa Fe

History Library, Museum of New Mexico
Palace of the Governors
P.O. Box 2097
Santa Fe, New Mexico 87504-2087
Contact: Tomas Jaehn, Librarian
(505) 476-5090
tjaehn@mnm.state.nm.us

I searched collections through OANM and then visited the archive.

Photo Archives
History Library, Museum of New Mexico
Palace of the Governors
P.O. Box 2097
Santa Fe, New Mexico 87504-2087
(505) 476-5092

This archive is not searchable online. I reviewed subject files on site. "Fire" is a subject heading in this archive. Most of the fires represented are urban. A photograph of "Fort Wingate destroyed by fire" is dated July 21, 1896. There are photographs of various rural fires in New Mexico and other western states. There is a photograph of a forest fire near Eldora, Boulder County, Colorado dated 1917(?) and another of a fire near Pagosa Springs, Colorado dated 9/53. Several photographs taken in New Mexico are recent (mid-twentieth century) and give no locations. The earliest rural fire in New Mexico included here is the "Clear Creek Forest Fire" of 1939.

Works Progress Administration files, History Library, Museum of New Mexico

These files contain interviews gathered in the approximate period 1933-1940, as well as some historical essays.

Works Progress Administration files: Citations

In notes dated September 19, 1916, Dorris Fish, Librarian of the Harwood Foundation, Taos, New Mexico discusses fireballs. This is a description of fireballs and ball lightning. [WPA 5-5-60, #7]

Kenneth Fordyce records (January 30, 1937) an area about 16 miles southwest of Raton and a short distance from the Van Houten coal camp, where a fire burns continuously on the ground surface, perhaps fed by natural gas. He says there are stories of early pioneers saved from Indians who were frightened away by this phenomenon. [WPA, 5-5-52, #28]

Fordyce also records (June 20, 1938) that "Chuck Carson, who lived with the Ute Indians in northern New Mexico for several months after they captured him, escaped and was pursued by a group of Ute men. Carson caused the fire to blaze by digging near it with a hunting knife. The Ute men were scared off, believing that Carson was a magician. [WPA, 5-5-60, #29]

State Office, Bureau of Land Management, Santa Fe

Bureau of Land Management
1474 Rodeo Drive
Santa Fe, New Mexico 87505
(505) 438-7542
http://www.blm.gov

Land patents may be searched online at this site. I visited the Santa Fe office to read the reports of the Commissioner of the General Land Office on microfiche.

Reports of the Commissioner, General Land Office

The General Land Office is the predecessor agency of the Bureau of Land Management of the Department of the Interior. The GLO was originally authorized by the U.S. Congress in 1812 as a bureau of the Treasury Department. It was reorganized and expanded in 1836.

The GLO was transferred to the Department of the Interior with the creation of the DOI in 1849. By 1912, a century after its founding, the GLO had 102 district land offices throughout the United States. The GLO was succeeded by the Bureau of Land Management, created by Congress in 1946.

From the first, the emphasis of the GLO was on the sale of public lands. The annual reports and extensive attached correspondence and reports of the General Land Office contain some references to fire. Most of these references are general—they identify neither a particular area nor fire causes, although the inference in most cases is that fires are human-caused.

References to fire in GLO reports begin c. 1880. Congress eventually responded with a statute dated February 24, 1897 (29 Stat. L. 594) to prevent forest fires (essentially the authorization of federal funding to support state fire-suppression programs).

Annual Reports of the Commissioner of the General Land Office: Citations

"Several reports have been received relative to the destruction of large bodies of timber by cyclones and forest fires. Negotiations are in progress to dispose of fallen and of scorched and standing timber in these cases." [*Annual Report of the Commissioner of the General Land Office for the Year 1883*, p. 29. Washington: Government Printing Office] "Special timber agents were enjoined to use their utmost efforts to prevent the spread of forest fires and to check wanton waste and destruction of public timber from any cause, and during the year the extinguishment of a large number of such fires through their efforts saved much valuable timber and other property, and probably prevented loss of life" [*Annual Report of the Commissioner of the General Land Office for the Year 1884*, p. 145. Washington: Government Printing Office].

"The attention of the public is called to the fact that immense areas of the public forests are annually destroyed by fire, originating, in many instances, through the carelessness of prospectors, campers, hunters, sheep herders, and others, while in some cases the fires are started with malicious intent. Warning is hereby given that the origin of all forest fires will be closely investigated and, where the fire is ascertained to have originated through carelessness or design, the persons implicated will be prosecuted to the fullest extent of the law" [Circular signed by Binger Hermann, Commissioner, General Land Office, July 28, 1897. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1897. Report of the Commissioner of the General Land Office*, p. 81. Washington: Government Printing Office].

The federal statute made the willful or malicious setting of a fire on public lands a misdemeanor punishable by fine or imprisonment or both. Fines were to be deposited in the public school fund of the county where the offense was committed.

"It is estimated that more than eleven billions of feet of public timber have been destroyed by fire within the past thirty-five years, representing in value many millions of dollars. This actual present loss in timber is, however, insignificant in comparison with the effects of the fires on the future of these forests, since to this direct loss must be added the prospective increase in value of the young and growing forest during the years since they were destroyed, and also the injury to the productiveness of the soil" [*Annual Report of the Commissioner of the General Land Office to the Secretary of the Interior for the Fiscal Year Ended June 30, 1898*, p. 86. Washington: Government Printing Office].

The General Land Office report for 1899 specifies that 149 fires in Arizona burned 44,430 acres (the greatest area in any state reported), while 23 fires in New Mexico burned 6,463 acres [*Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1899. Report of the Commissioner of the General Land Office*, p. 104. Washington: Government Printing Office].

In 1900 the General Land Office reported that "last season there were 9 of the large devastating (Class 3) fires, burning over a total area of 79,500 acres and costing $8,835.

This season there have been 8 such fires, burning over 50,680 acres, and costing $2,315" [*Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1900. Report of the Commissioner of the General Land Office*, p. 98. Washington: Government Printing Office].

COLORADO

National Archives and Records Administration, Denver

National Archives and Records Administration
Rocky Mountain Region
Denver Federal Center, Building 48
West 6th Avenue and Kipling Street
Denver, Colorado 80225
(303) 236-0817

http://www.archives.gov/facilities/co/denver.html

I reviewed the published finding aids including Svenningsen (1980, *Preliminary Inventory of the Pueblo Records*) and then visited this archive.

The decimal file for the Northern, Southern and United Pueblos is a looseleaf finding aid that lists all correspondence and reports on file c. 1868–1941. Subjects are given under numerical headings and subdivisions of headings 000 ["General and Statistical"] through 992 ["Students in Government Service"]: e.g., railroad, roads, bridges, cattle trails, homesteads, allotments. "Destruction by fire" is a heading. See Southern Pueblos decimal file, Box 84, FRC 163171-76, 406: Destruction by Fire, etc. 1927–1929. See Northern Pueblos Agency decimal file, Box 42, FRC 163231-36, 420–421: Building Equipment, Fire Extinguishers and Fire Protection 1928-1935. "Lands" fall under heading 300.

See also *Preliminary Inventory of the Pueblo Records Created by Field Offices of the Bureau of Indian Affairs* (Svenningsen 1980) for a description of these records, mainly by agency and school.

I found no references to anthropogenic fire in the Pueblo Records.

Denver Public Library

Denver Public Library
10 W. Fourteenth Ave. Pkwy.
Denver, Colorado 80204
(720) 865-1111
http://lcweb2.loc.gov/ammem/award97/codhtml/

I reviewed photographs that have been placed online and then visited this archive.

Photography Collection, Western History/Genealogy Department, Denver Public Library

The collection contains some 550,000 photographs. About 95,000 of these have been digitized. There are 1,545 images of fire in this database. Most are of urban fires, fire stations and fire companies. There are thirty images of forest fires, most in Colorado and more northern states, but none in our study area.

The web address for the images that have been digitized is: http://lcweb2.loc.gov/ammem/award97/codhtml/

Conservation Collection, Denver Public Library

Contact: Colleen Nunn or Robert Russell
(720) 865-1111

I reviewed collection descriptions online and then visited this archive.

The website for this collection can be reached by entering denver.lib.co.us, then going to Western History Photos, then entering /dpl in the web address.

The several collections subsumed under the general heading Conservation Collection are all post-1910.

U.S. Geological Survey, Department of the Interior

Room C2002, Building 20
Denver Federal Center
6th Ave (U.S. Highway 6) and Kipling Street
Lakewood, Colorado
Carol Edwards
(303) 236-1010

U.S. Geological Survey Photographic Library

http://libraryphoto.er.usgs.gov.

This archive is not searchable online. I reviewed the card index and the photographs, arranged by state and photographer, on site.

The on-site card index is organized by state, county, and photographer. Although this is primarily a collection of geological features, most photographers took occasional images of other things, including camps, vegetation, group portraits, structures, towns, and archaeological sites. In Arizona, M. R. Campbell #816 is "Sheep and goats belonging to Navajo Indians." N. H. Darton #895 is "Railroad bridge across Canyon Diablo, Santa Fe."

I reviewed all entries for New Mexico, Arizona, and Cimarron County, Oklahoma. As a sample, I then checked all the Arizona photographs of D. E. Winchester (c. 1912), O. E. Meinzer (c. 1910 and 1913), N. H. Darton (n.d.: c. 1920?), F. C. Schrader (c. 1906–1915), A. C. Veatch (c. 1910) and M. R. Campbell (1903). I checked all the New Mexico photographs of R. H. Chapman (1905), C. N. Gould (n.d.), L. C. Graton (n.d.), M. K. Shaler (1906), W. T. Lee (n.d.: c. 1925?), and G. R. Mansfield (1918).

U.S. Geological Survey Photographic Library: Citations

I reviewed the C. N. Gould and W. D. Johnson photographs of Cimarron County, Oklahoma. Johnson's photographs nos. 55, 56, and 57 show action of prairie fire in Cimarron County c. 1902. Johnson notes that a road and the "tramped grass" bordering it fail to stop a fire when directly across its line of advance (#55). However, a single-furrow fireguard will halt the spread of fire (#56). In this case, the wind direction was parallel to the furrows. Likewise, a road (#57) will stop fire when the wind is parallel to the road.

TEXAS

DeGolyer Library

DeGolyer Library
P.O. Box 750396
Southern Methodist University
Dallas, Texas 75275-0396
(214) 768-4284
Ben Huseman, Curator: bhuseman@mail.smu.edu

I first reviewed PONI (the public online information service of the Southern Methodist University libraries). I then visited the DeGolyer Library.

Major subjects represented in the DeGolyer Library collections include the European discovery and exploration of the New World, and in particular the Spanish colonial incursion into North America. The Degolyer holds over 2,500 manuscript collections.

The Joel Buchanan Diary of March 22–May 27, 1887 (Accession Number 0385c) includes comments on Arizona and New Mexico. There is nothing directly relevant to fire history.

The N. B. Allyn travel journals of 1874 and 1894 (Accession Number 2238c) are manuscripts dealing mainly with travel through the Southwest. There is nothing in them directly relevant to fire history.

I also examined photograph collections relating to the Southwest. There were no environmental photographs or photographs of natural or man-caused fire in the study area, although there were several in other parts of the West.

Amon Carter Museum of Western Art

Amon Carter Museum
3501 Camp Bowie Blvd.
Fort Worth, Texas 76107
(817) 989-5171
Melissa G. Thompson, Registrar
melissa.thompson@cartermuseum.org

The Amon Carter photography collection catalogue has been published, most recently in 1993 (see Roark et al. 1993). I first reviewed the catalogue, then visited the

Amon Carter Library.

Among the photographers who worked in the study area and are represented in the Amon Carter collection are John K. Hillers (1843–1925); William Henry Jackson (1843–1942); Timothy H. O'Sullivan (1840–1882); and Erwin Evans Smith (1886–1947). All were distinguished environmental and landscape photographers. Smith took some notable photographs of cowboys at the campfire. However, I did not locate any images of anthropogenic fire in these collections.

National Archives and Records Administration, Southwest Region

National Archives–Southwest Region
501 West Felix Street
P.O. Box 6216
Fort Worth, Texas 76115
(817) 334-5525
http://www.archives.gov/facilities/tx/fort_worth.html

The National Archives–Southwest Region contains records of the Soil Conservation Service, of all the Indian agencies that have operated in Oklahoma, of the National Park Service, and extensive microfilm records of the National Archives relating to Indian affairs within the study area.

I reviewed the published guide to records compiled by Kent Carter and Nancy Malan (Carter and Malan 1994), then visited the archives.

Soil Conservation Service

The records of the Soil Conservation Service (Record Group 114) are in Stack Area B, Row 27, Compartment 8, Shelf 7. General records are designated SP 25(BI)

The "Fire Control" files (classification 278) for New Mexico, Oklahoma, and Texas (Box 245-311) are empty.

The records of the Regional Office (HM1993, Box 13, R105.711) include records of fire control. The fire control measures that have been employed statewide in Texas are described as of c. 1936.

The Soil Conservation Service records contain correspondence relating to land management (Ac. 1166, W58A, Boxes 112 through 123, also numbered 46 through 57).

A discussion of fire control is located in Box 121, Folder 734-03. Two small fires are referred to as “forest fires” but are described as fires of a few acres in scattered timber. These occurred near Bonham, Texas. They were suppressed by SCS personnel.

The general records of the Soil Conservation Service office in Clovis, New Mexico (SP25[BI] General Records 1938–1942) are on file. They contain no fire history.

The records of the Perryton, Texas Area Office of the Soil Conservation Service contain a discussion of projects in the Rita Blanca area. These records do not include any fire history.

National Park Service

National Park Service records (Record Group 79) are in Stack Area A, Row 29, Compartment 3, Shelf 1.

There are records relating to fires and fire control in the Amistad National Recreation Area, Texas; Big Bend National Park, Texas; Hot Springs National Park, Arkansas; Platt National Park, Oklahoma. Files also include National Park Service directives generally relevant to New Mexico and Arizona.

The earliest records in these files are c. 1906—e.g., a questionnaire dealing with the kind and quality of timber in Platt National Park, Oklahoma

There are reports of individual fires in Oklahoma in the period 1934–1937 and in the 1940s. None of these is within the study area.

Microfilm

Records on microfilm include field survey notes of the Cheyenne and Southern Arapaho lands as of 1873 (7RA154, Roll 1). The survey notes and general descriptions deal with the quality of lands, the timber, and water sources. However, these contain no references to fire.

The records of land and field survey notes of the Osage Agency (7RA201, Rolls 1-1. 1870) discuss the quality of lands, timber, and water. There are no references to fire or fire history.

Further records of land and field survey notes for the Osage Agency (7RA202, Rolls

1-4, 1908) refer to houses, barns, topography, soil, timber, water and drainages, and fields. Although there are references to floods and weather phenomena, I found no references to fire.

Records of the Arizona Superintendency of Indian Affairs are in Letters Received by the Office of Indian Affairs, 1824–1881 (M234. 962 Rolls. See p. 8). Rolls 3-28 cover the period 1863–1880.

There is at least one reference to the use of fire in warfare. In a letter of George Leihy, Superintendent of Office of Indian Affairs, La Paz, April 12, 1866 to Commissioner of Indian Affairs D.N. Cooley, Leihy describes a Hualapai raid and the killing of a party of prospectors, and the burning of a cabin at "a place called the Willows, on the road from Fort Mojave to Prescott..."

The Center for American History, Austin

The Center for American History
SRH2.101
The University of Texas at Austin
Austin, Texas 78712
(512) 485-4515
http://www.cah.utexas.edu/

I performed an online search of archival and manuscript collections. I did not visit the Center for American History.

The Center contains some 7,500 individual manuscript collections. An online search yielded about 200 references to fire in the study area. Most have to do with urban fires and disasters and fire insurance. I did not find any references to anthropogenic fire and responses to fire before 1890.

WASHINGTON, D.C. AREA

Library of Congress

The Library of Congress
101 Independence Avenue, S.E.
Washington, D.C. 20540
(202) 707-5000
http://www.loc.gov/pubrr/oncat.html

Before visiting the Library of Congress, I searched the online catalogue. The entire catalogue comprises some 12 million records. I searched the print, photograph, and archival (manuscript) databases. There are 2,501 references to fire in this catalogue. I reviewed all of them.

An advanced search of the terms "fire and "Southwest" gave 46 responses. I reviewed all of them. I also searched the terms "Indian fire" and "prairie fire."

I searched for all references to fire and forest fires in Arizona and New Mexico in the Eureka database. Collection scopes/abstracts are included in this database. I reviewed descriptions of approximately 400 collections.

All manuscript collections are listed under the description of the Manuscript Reading Room. The Multiple Prints and Photographs Collection contains 79 references to "forest fire."

There are a few references to traditional fire-fighting methods (see illustration of "The Western prairie farmer running the 'fire-guard' [a fire break created with a horse-drawn plow]). In *Harper's Weekly,* March 28, 1868. p. 196.

See also "Gila Forest Camp, N. Mex., 109th Engr's., 34th Div., June 1918…" The caption reads: "Members of Division standing at attention, men in covered wagons and carts behind, tents, and smoke from fires in background."

I found no other references to anthropogenic fire and responses to fire before 1890.

National Agricultural Library

The National Agricultural Library
Special Collections, Room 1402
10301 Baltimore Avenue, Beltsville, Md. 20705
(301) 504-5876
Fax: (301) 504-6927
Contact: Reference Librarian Sara Lee

I first checked "Agricola" online, then visited the Library.

"Agricola" is an online access to the materials and collections available in the National Agricultural Library. The web address is http://www.nal.usda.gov/ag98/ag98html.

Agricola contains an online public access catalogue of books, serials, audiovisuals, and other resources held by the NAL and cooperating agencies. It also contains a citation index of journal articles, book chapters, short reports, and reprints.

Reference materials and stations are on the main floor. The Directory Catalogue of the National Agricultural Library (1968) is also available here. Special Collections are on the 14th floor.

Forest Service Historical Photograph Collection

www.nal.usda.gov/speccoll/collect/forest.html

This collection consists of approximately 60,000 black-and-white images, dating from the late nineteenth century to the second half of the twentieth century. The collection is in five Lektrievers. Staff asks that photos be cited by the Lektriever number, the drawer in that Lektriever (drawers are numbered on the side), and by negative number.

Photographs of fire date approximately 1918–1967. These are pictures of firefighters suppressing fires on National Forest lands.

I did not find any images of anthropogenic fire or wildfire dating before 1900. I reviewed all files for Arizona, New Mexico, Oklahoma, and Texas relating to fire and fire suppression and copied some prints.

Negative no. 84236 (Lektriever 5, Drawer 420) shows hand fire suppression with water and a sprinkler in Oklahoma prairie country c. 1908. Likewise photograph 12751-A, located in Lektriever 5, Drawer 419, illustrates fire suppression with hand tools in the Oklahoma grasslands, c. 1918.

Negative no. 30239 (Lektriever 4, Drawer 388) shows fire control in New Mexico c. 1908. An active fire was photographed at night. Negative no. 233365 (Lektriever 4, Drawer 345) shows an abandoned campfire on the Gila National Forest c. 1928. Negative no. 233489 (Lektriever 5, Drawer 407) shows a Gila National Forest officer (1928) going out to a fire on horseback, with an emergency fire tool and rations. Negative no. 381819 (Lektriever 4, Drawer 388) shows the Pueblo Canyon Fire on the Carson National Forest, June 1939. Negative no. 414771 (Lektriever 4, Drawer 389) shows a burned-over area on the Tonto National Forest, Arizona, June 1939.

Negative no. 440734 (Lektriever 4, Drawer 391) shows a burned-over area in the

Carson National Forest in July, 1946. The same area is depicted in negative no. 440676. Here the original spruce fir forest was destroyed by fire c. 1875. The aspen that replaced the earlier forest was destroyed by insects. The grass which came in under the aspen was heavily overgrazed when the photo was taken in 1946.

Special Collections–Manuscripts

Librarian Sara Lee has prepared a printout with names, numbers, and descriptions of all manuscript collections of the NAL (numbering up to 309, with at least two vacant numbers). This includes several photograph and slide collections. I read this in hard copy and on screen (it is not available online). I found no references to fire history.

National Archives and Records Administration

The National Archives and Records Administration
8601 Adelphi Road
College Park, Maryland 20740-6001
http://www.archives.gov/research_room/index.html

I visited the Maryland location of the National Archives, usually known as NARS II.

The records in NARS II are divided by type: still photos, textual, and cartographic elements of the same record are on separate floors.

Records of the U.S. Forest Service (In Record Group 95, Civilian Records)

Contact: Joe Schwartz
(303) 837-2961

Record Group 95 includes a box list of the records of the office of the Chief, U.S. Forest Service 1908–1947. General Correspondence is under Entry 61.

Record Group 16 contains the records of the Office of the Secretary of Agriculture from 1906 to the 1970s. The general correspondence file is in Stack 170, Row 5, Compartment 6, Shelf 6. Box 2 contains correspondence relating to fire.

General correspondence of the division of fire control in the period 1909–1937 is in Record Group 95, Accession Number 1124, Boxes 39-48.

These records contain some anecdotal history having to do with the destructiveness of forest fires, but no indication that fire may be necessary to renew and sustain forests. There are no references to the use of fire to modify landscapes.

Still Photography

Contact: Ed McCarter
(301) 837-0539 or 837-1956

The prints and copies at the National Agricultural Library are a subset of the Forest Service negatives in the National Archives. There are some 60,000 Forest-related prints in the National Agricultural Library, and about 150,000 negatives in the Archives.

Using these negatives is a somewhat complicated business: some images lack negative numbers; some rolls are on the spool backward and appear in reverse. The researcher can proceed from the subject to the state to the Forest to the negative number, but there appears to be no way to track in the opposite direction. Only a few of the microfilm images have any explanatory notes or captions.

The separate subject list is arranged by code numbers including:

24410 (fire damage, injured trees)
44914 (fire effects, damage, wildlife)
44950 (fire effects, fire behavior)
51010 (forest fires, causes, general)
51040 (forest fires, damaged property).

There are two images of "burned over areas, old burns" on the Kaibab National Forest, Arizona: 365726, 365727. These do not include dates or other details.

Five "old burns" are pictured on the Coconino National Forest, Arizona: 05881, 053355, 090926, 090929, and 225640. There are three on the Tonto National Forest, Arizona: 299379, 299385, 380214. There is one on the Carson National Forest, New Mexico: 070370. There is one on the Cibola National Forest, New Mexico: 505018. There are seven on the Santa Fe National Forest, New Mexico: 070367, 076771, 076767, 016691A, 178441, 178440, and 369942.

No old burns are recorded in Oklahoma and Texas.

"Fire effects, damage, general" is a subject heading, but there are no corresponding images in Arizona or New Mexico.

"Forest fires, causes, man" is a subject heading, but there are no corresponding images in Arizona. In New Mexico there is one image: 233365 (Gila National Forest. This is dated 7/1928, the photographer is identified as "Shipp").

Cartographic

Contact: Jerry Luchansky
(301) 837-3200

Record Group 95, Entry 59 includes "Forest Fire Defense Maps Third Deficiency Estimates" for the period 1941–42. There are nine maps in this file.

Record Group 95, Entry 83 contains "Cooperative Fire-Control Maps 1931–1940." There are four maps in this file.

None of these maps contains any fire history.

National Anthropological Archives, Smithsonian Institution

The National Anthropological Archives
4210 Silver Hill Road
Smithsonian Institution
Museum Support Center
Suitland, Maryland 20748
Contact: Susan McElrath
(301) 238-2872
http://www.nmnh.si.edu/naa

Before visiting the National Anthropological Archives, I first searched all Smithsonian archives online. Archives include the general Smithsonian archive, the archival, manuscript and photograph collections, the Smithsonian American Art Museum research databases, American Gardens, the Folklife Archives, the Human Studies Film Archives, and specialized research bibliographies. However, the National Anthropological Archives are most directly relevant to this inquiry.

The photograph collections of the National Anthropological Archives are indexed by tribe. A master set of copy prints by tribe is also available for reference.

Sorting by "Collection Descriptions" and limiting to "National Anthropological

Archives" a general keyword search of "fire" gave 545 responses (by tribes, including all tribes in the United States). This includes manuscripts, photographs, negatives, works of art, drawings on single pages, and sound recordings. Searching this, I found that the Southwest was perhaps the best represented region, but most references are to ritual use of fire, Pueblo fire societies, or making fire. There are no references to use of fire as a means of landscape modification. There are no direct references to use of fire in war.

A series of photographs of fire control at Fort Apache dates to the 1930s.

See also Glenn (1992) for descriptions of manuscript and photograph collections.

OTHER LOCATIONS

Forest History Society

Forest History Society
701 Wm. Vickers Ave.
Durham, North Carolina 27701-3162
Tel: (191) 682-9319
Fax: (919) 682-2349

Photo Collection, Forest History Society
http://foresthistory2.lib.duke.edu/RIS/RISWEB.ISA

This address is also the access to the oral history program and archival guide described below.

I checked this site online. I did not visit the Forest History Society.

There are some 25,000 photographs in this collection of the Forest History Society. They are mostly in the period 1930–1960s. I found 26 images of fire, but none of these is in the Southwest.

Oral History Program, Forest History Society

There is an online index of all interviews, with summaries. I reviewed this file. There do not appear to be any interviews relating to the study area, except one for Edward Clayton Crafts (1910–1980) who worked at the Fort Valley Forest Range Experiment Station in Arizona early in his career.

Archival Guide, Forest History Society

This is the current version of Richard C. Davis's *North American Forest History: A Guide to Archives and Manuscripts in the United States and Canada* (Santa Barbara, California: American Bibliographic Center, Clio Press, 1977).

The database contains 641 references to fire, 302 references to New Mexico, and 399 references to Arizona. This database references primarily published documents. There are also entries for unpublished collections such as the U.S. Forest Service History Collection. Most of these are recent, e.g., clipping files.

University of Chicago

University of Chicago Library
1100 East 57th Street
Chicago, Illinois 60637
(773) 702-8705

www.lib.uchicago.edu

American Environmental Photographs (University of Chicago Library)

I reviewed this collection online. I did not visit the University of Chicago.

This collection consists of approximately 4,500 photographs documenting natural environments, ecologies, and plant communities in the United States at the end of the nineteenth and beginning of the twentieth century. These photographs were produced between 1896 and 1936 by a group of influential American botanists. They provide an overview of representative natural landscapes across the United States.

There are 30 to 40 images of fire and landscapes affected by fire. Three of these are within the study area:

Burned region in a *Picea* forest, San Francisco Mountain, Arizona (no date)

Burned *Picea* forest on San Francisco Mountain, Arizona (no date)

Thirty-one year old *Picea engelmannii* burn at 9,000 feet in New Mexico mountains (no date).

University of Missouri

Western Historical Manuscript Collection-Columbia
23 Ellis Library
University of Missouri
Columbia, Missouri 65201-5149
(573) 882-7441

http://www.system.missouri.edu/whmc/intro.html

Reference requests to this collection go through staff. I corresponded with them and submitted an inquiry online. I did not visit the University of Missouri.

At my request, a manuscript specialist (Ms. Sharon Brock) queried the general catalogue for references to fire, forest fires, and wildfire in Arizona, New Mexico, and Texas prior to 1891. She found no references in any of the three states, although there are numerous references to fires in Missouri and one to forest fires in Louisiana in the period 1927–1939.

SUMMARY AND CONCLUSIONS

The following are the substantial and relevant references identified by this investigation. See above for details:

- Documentary Relations of the Southwest, housed at the University of Arizona, is a group of manuscript collections covering the period c. 1520–1820 in New Spain, including what is now Arizona and New Mexico. There are two references to the use of fire by Hispanics as a military technique in the period 1769–1770.
- The Comaduran Report of 1830 describes Apaches driving game with fire in the Tucson, Arizona vicinity.
- The Doris Duke American Indian Oral History Transcript Collection at the University of Oklahoma includes descriptions by Arapaho, Cherokee, Delaware and Shawnee informants of wildfire, and the response of the Indian communities to wildfire, in the Oklahoma grasslands in the late nineteenth and early twentieth centuries. A Fort Sill Apache informant describes the use of fire in war by Mexican troops in southwestern New Mexico and northern Mexico.
- The Doris Duke American Indian Oral History Collection at the Center for

Southwest Research (University of New Mexico) includes descriptions by San Juan Pueblo and Isleta Pueblo informants of the use of fire in agriculture (to burn weeds and clean ditches) in the twentieth century.

- The Works Progress Administration interview files at the History Library, Santa Fe, describe the defensive use of fire in northern New Mexico in the nineteenth century by Anglos against Indians including Utes.
- The Pioneers Foundation Oral History Collection in the Center for Southwest Research, University of New Mexico, describes an Anglo response to prairie fire in northeastern New Mexico or western Kansas in the 1880s.
- The reports of the Commissioner of the General Land Office (Department of the Interior) for the 1880s and 1890s describe the accidental or malicious setting of fires by Hispanics and Anglos on New Mexico forest lands.
- The U.S. Geological Survey Photographic Library in Denver, Colorado describes prairie fire in Cimarron County, Oklahoma c. 1902, and methods of fire prevention employed by Anglos.
- The Records of the Arizona Superintendency of Indian Affairs (in Letters Received by the Office of Indian Affairs, 1824-1881, M234, National Archives and Records Administration) contain at least one reference to the use of fire in warfare by Hualapai people in southern Arizona (1866).
- The Forest Service Historical Photograph Collection negatives in the National Archives (College Park, Maryland) include various images of old burns in Arizona and New Mexico, but no indication of their origin or purpose. The assumption appears to be that these are accidental and natural burns dating perhaps as early as the 1870s
- The American Environmental Photographs collection in the University of Chicago Library includes three images of fire and landscapes affected by fire within the study area.

In summary, war, agriculture, and hunting are the most frequent uses of anthropogenic fire recorded in unpublished archival sources in the study area.

RECOMMENDATIONS FOR FURTHER RESEARCH

Unpublished archival references to fire use and to human response to wildfires within the study area are sparse and difficult to track down. My basic method in this study has been to identify collections within the area of study, to review indices online when possible, to eliminate collections having no references to fire, and then to visit relevant repositories to scan entire collections that do contain references to fire and fire use.

Early in the project I discussed the problem with Stephen J. Pyne, the author of *Fire in America: A Cultural History of Wildland and Rural Fire* (Seattle: University of Washington Press, 1982). He characterized the search for archival references as "trolling in the middle of the ocean" and pointed out that a central problem lies in the fact that references to fire may occur anywhere in unpublished materials. He observed that when a diarist or other source refers to fire, he is likely to do so over and over. However, Dr. Pyne added, very few diarists and correspondents of the nineteenth century or earlier had a particular interest in this subject (Stephen J. Pyne, pers. comm. 2003).

Dr. Pyne also stated that in his opinion this project should be a multi-year investigation by a research team (ibid.). I understood him to mean that the references are so widely dispersed over such a large body of archival material that finding them requires an extensive commitment of time and resources. This has certainly proved true.

Taking into consideration the results obtained so far, specific possibilities for further research are as follows:

- More detailed search of the Sound Recording Collection of the Arizona State Museum. The existing index is too general to be useful in researching a single issue such as fire and fire use. More research would require a fairly extensive sampling on site.
- More detailed investigation of the history of the Cherokee lands of Oklahoma, which included the Kiowa Grasslands. The point of departure would be:

  Southwell, Kristina L.

  1996 *Cherokee Nation Papers: Inventory and Index*. Norman: Associates of the Western History Collections.
- Review of historic newspaper files in the study area. Major repositories are in Santa

Fe, Tucson, and Austin, but collections are also to be found in county courthouses and university libraries, as well as in the National Archives.

- More detailed study of records in the National Archives relating to American Indians within the study area, in particular records on microfilm that could be read at the Rocky Mountain regional archive in Denver, Colorado. Specific possibilities are the Special Files of the Office of Indian Affairs 1807–1904 (M574, 85 rolls); records of BIA field agencies having jurisdiction over the Pueblo Indians (M1304, Rolls 1-32); and Interior Department Territorial Papers, Arizona 1868-1913 (M429, 8 rolls) and New Mexico 1851-1914 (M364, 15 rolls).
- Review of unpublished Masters' theses and doctoral dissertations within the study area, to be identified by correspondence with universities in Arizona, New Mexico, Oklahoma and Texas.
- Search for unpublished historic diaries within the study area. The published literature includes such well-known entries as the *Benavides Memorial of 1634* (Benavides 1945) and Bartlett's *Personal Narrative* (Bartlett 1965). There are hundreds of such published diaries and first-person narratives, but there are others that remain unpublished. Two examples are Captain Hugo O'Conor's campaign diaries for the period 1772–1776, in which O'Conor gives accounts of his pursuit of hostile Indians in parts of present-day Chihuahua, Coahuila, Sonora, Texas, New Mexico, and Arizona (M-M 1788, Bancroft Library, University of California); and Antonio Cordero's diary of an expedition against hostile Indians for the period 8/29/1789–11/18/1789 (original in the Archivo General de la Nación, Mexico City, Provincias Internas Vol, 193 FF. 289-310). These contain detailed descriptions of numerous Indian tribes and groups.
- Review of the homestead files (General Land Office) for the study area. The homestead files are detailed accounts of the process of homesteading and the physical improvements made by homestead claimants. These are on file in the National Archives, Washington, D.C.
- Online sample of major university and other archives outside the study area. Examples are the Columbia University archives (New York, New York) and the

collections of the Huntington Library (San Marino, California). Both hold major Southwestern materials.

Appendix 1 below (budget for Phase II) summarizes the above in terms of time and cost.

SOURCES CITED

Bahre, Conrad J.
1985 Wildfire in Southeastern Arizona Between 1859 and 1890. *Desert Plants* 7:190–194.

Bartlett, John Russell
1965 *Personal Narrative of Explorations and Incidents in Texas, New Mexico, California, Sonora, and Chihuahua, Connected with the United States and Mexican Boundary Commission, During the Years 1850, '51, '52, and '53.* Chicago: Rio Grande Press.

Beaglehole, Ernest
1936 *Hopi Hunting and Hunting Ritual.* Yale University Publication in Anthropology 4.

Benavides, Fray Alonso de
1945 *Fray Alonzo Benavides' Revised Memorial of 1634*, edited by Frederick W. Hodge, George P. Hammond, and Agapito Rey. Albuquerque: University of New Mexico Press.

Carter, Kent, and Nancy Malan (compilers)
1994 *Guide to Records in the National Archives–Southwest Region.* Washington, D.C. National Archives and Records Administration.

Condie, Carol J., and Carol Raish
2003 Indigenous and Traditional Use of Fire in Southwestern Grassland, Woodland, and Forest Ecosystems. In *Homeowners, Community and Wildfire: Science Findings from the National Fire Plan*, Pamela J. Jakes, compiler, pp. 26–35. Proceedings of the Ninth International Symposium on Society and Resource Management. Bloomington, Indiana June 2–5, 2002. Forest Service General Technical Report NC-231.

Davis, Richard C.
1977 *North American Forest History: A Guide to Archives and Manuscripts in the United States and Canada.* Santa Barbara, California: American Bibliographic Center, Clio Press.

Dobyns, Henry F.
1981 *From Fire to Flood: Historic Human Destruction of Sonoran Desert Riverine Oases.* Socorro, New Mexico: Ballena Press.

Drucker, P.

1942 *Culture Element Distribution Studies of the University of California: XVII: Yuman-Piman.* University of California Anthropological Records 6.

General Land Office (Department of the Interior)

1883 *Annual Report of the Commissioner of the General Land Office for the Year 1883.* Washington: Government Printing Office]

1884 *Annual Report of the Commissioner of the General Land Office for the Year 1884.* Washington: Government Printing Office

1897 Report of the Commissioner of the General Land Office. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1897.* Washington: Government Printing Office

1898 *Annual Report of the Commissioner of the General Land Office to the Secretary of the Interior for the Fiscal Year Ended June 30, 1898.* Washington: Government Printing Office.

1899 Report of the Commissioner of the General Land Office. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1899.* Washington: Government Printing Office.

1900 Report of the Commissioner of the General Land Office. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1900.* Washington: Government Printing Office

Gifford, E. W.

1936 *Northeastern and Western Yavapai.* University of California Publications in American Archaeology and Ethnology 34.

1941 *Culture Element Distribution Studies of the University of California XII: Apache-Pueblo.* University of California Anthropological Records 4.

Hill, W. W.

1938 *Navaho Agricultural and Hunting Methods.* Yale University Publication in Anthropology 18.

Kaib, J. Mark

1998 Fire History in Riparian Canyon Pine-Oak Forests and the Intervening Desert Grasslands of the Southwest Borderlands: A Dendrochronological, Historical and Cultural Inquiry. Unpublished Master's Thesis, School of Renewable Resources, University of Arizona, Tucson.

National Archives Trust Fund Board

1998 *American Indians: A Select Catalogue of National Archives Microfilm Publications.* National Archives Trust Fund Board: National Archives and Records Administration, Washington D.C.

Pyne, S. J.

1982 *Fire in America: A Cultural History of Wildland and Rural Fire.* Princeton: Princeton

Drucker, P.
1941 *Culture Element Distribution Studies of the University of California: XVII: Yuman-Piman.* University of California Anthropological Records 6.

General Land Office (Department of the Interior)
1883 *Annual Report of the Commissioner of the General Land Office for the Year 1883.* Washington: Government Printing Office]
1884 *Annual Report of the Commissioner of the General Land Office for the Year 1884.* Washington: Government Printing Office
1897 Report of the Commissioner of the General Land Office. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1897.* Washington: Government Printing Office
1898 *Annual Report of the Commissioner of the General Land Office to the Secretary of the Interior for the Fiscal Year Ended June 30, 1898.* Washington: Government Printing Office.
1899 Report of the Commissioner of the General Land Office. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1899.* Washington: Government Printing Office.
1900 Report of the Commissioner of the General Land Office. In *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1900.* Washington: Government Printing Office

Gifford, E. W.
1936 *Northeastern and Western Yavapai.* University of California Publications in American Archaeology and Ethnology 34.
1940 *Culture Element Distribution Studies of the University of California XII: Apache-Pueblo.* University of California Anthropological Records 4.

Hill, W. W.
1938 *Navaho Agricultural and Hunting Methods.* Yale University Publication in Anthropology 18.

Kaib, J. Mark
1998 Fire History in Riparian Canyon Pine-Oak Forests and the Intervening Desert Grasslands of the Southwest Borderlands: A Dendrochronological, Historical and Cultural Inquiry. Unpublished Master's Thesis, School of Renewable Resources, University of Arizona, Tucson.

National Archives Trust Fund Board
1998 *American Indians: A Select Catalogue of National Archives Microfilm Publications.* National Archives Trust Fund Board: National Archives and Records Administration, Washington D.C.

Pyne, S. J.
1982 *Fire in America: A Cultural History of Wildland and Rural Fire.* Princeton: Princeton

University Press.

Roark, Carol E., Paula Ann Stewart, and Mary Kennedy McCabe
1993 *Catalogue of the Amon Carter Museum Photography Collection.* Fort Worth: Amon Carter Museum.

Spier, Leslie
1928 *Havasupai Ethnography.* American Museum of Natural History Anthropological Papers 29.

Stewart, Omer C.
1942 *Culture Element Distribution Studies of the University of California:XVIII, Ute-Southern Paiute.* University of California Anthropological Records 6:231–360.
2002 *Forgotten Fires: Native Americans and the Transient Wilderness,* edited and with introductions by Henry T. Lewis and M. Kat Anderson. Norman: University of Oklahoma Press.

Svenningsen, Robert (compiler)
1980 *Preliminary Inventory of the Pueblo Records Created by Field Offices of the Bureau of Indian Affairs; Record Group 75.* National Archives and Records Service. Washington: General Services Administration.

SELECT LIST OF PUBLISHED SOURCES

Allen, Craig D.
2002 Lots of Lightning and Plenty of People: An Ecological History of Fire in the Upland Southwest. In *Fire, Native Peoples and the Natural Landscape,* edited by Thomas R. Vale. Washington: Island Press

Bahre, Conrad .J.
1974 Effects of Fire on Temperate Forests: Western United States. In *Fire and Ecosystems,* edited by T. T. Kozlowski and C. E. Ahlgren, pp. 279–319. New York: Academic Press.
1991 *A Legacy of Change: Historic Human Impact on Vegetation of the Arizona Borderlands.* University of Arizona Press, Tucson

Baisan, C. H.
1988 Fire History of the Rincon Mountain Wilderness, Saguaro National Monument. Unpublished manuscript prepared for Saguaro National Monument, Tucson. 82 p.

Barrows, J. S.
1978 *Lighting Fires in Southwestern Forests.* Final report to USDA Forest Service Interim Forest Range Expansion Station, coop. Agreement 16-568-CA with Rocky Mountain Forest Range Expansion Station, Fort Collins, Colorado. 154 p.

Bock, J. H., C. E. Bock, and J. R. McKnight
1976 A Study of the Effects of Grassland Fires at the Research Ranch in Southeastern Arizona. *Journal of the Arizona Academy of Science* 11:49–57.

Bonnicksen, T. M., M. K. Anderson, H. T. Lewis, C. E. Kay, and R. Knudson
2000 American Indian Influences on the Development of Forest Ecosystems. In *Ecological Stewardship: A Common Reference for Ecosystem Management,* edited by N. C. Johnson, A. J. Malk, W. T. Sexton, and R. Szaro, pp. 439–470. Oxford: Elsevier Science.

Boyd, R.
1986 Strategies of Indian Burning in the Willamette Valley. *Canadian Journal of Anthropology* 5:65–96.

Branscomb, B. L.
1958 Shrub Invasion of a Southern New Mexico Grassland Range. *Journal of Range Management* 1:129–132.

Butzer, K. W.
1990 The Indian Legacy in the American Landscape. In *The Making of the American Landscape,* edited by M. P. Conzen, pp. 27–50. London: Harper-Collins Academic.

Cable, D. R.
1967 Fire Effects on Semidesert Grasses and Shrubs. *Journal of Range Management* 20:170–176.

Cooper, C. F.
1960 Changes in Vegetation, Structure and Growth of Southwestern Pine Forests Since White Settlement. *Ecological Monographs* 30(2):129–164.

Covington, W. W., and M. M. Moore
1994 Southwestern Ponderosa Pine Forest Structure: Changes Since Euro-American Settlement. *Journal of Forestry* 92:39–47.

Day, G. M.
1953 The Indian as an Ecological Factor in the Northeastern Forest. *Ecology* 34:329–346.

Fish, S. K.
1996 Modeling Human Impacts to the Borderlands Environment from a Fire Ecology Perspective. In *Effects of Fire on Madrean Province Ecosystems: A Symposium Proceedings,* P.F. Ffolliott et al., tech. coord., pp. 125–134. General Technical Report RM-289. Fort Collins, Colo.: U.S.D.A. Forest Service.

Glenn, James R.

1992 *Guide to the National Anthropological Archives, Smithsonian Institution.* Smithsonian Institution, National Anthropological Archives, Washington, D.C.

Grissino-Mayer, H. D.

1995 Tree-Ring Reconstructions of Climate and Fire History at El Malpais National Monument, New Mexico. Ph.D. diss., University of Arizona.

Grissino-Mayer, H. D., C. H. Baisan, and T. D. Swetnam

1995 Fire History in the Pinaleño Mountains of Southeastern Arizona: Effects of Human-Related Disturbances. In *Biodiversity and Management of the Madrean Archipelago: The Sky Islands of Southwestern United States and Northwestern Mexico,* tech. coord. L. F. DeBano et al., pp. 399–407. General technical report RM-264. Fort Collins, Colo.: U.S.D.A. Forest Service.

Hartmann, C. W.

1942 The Indians of Northwestern Mexico. *Congrés Internationale des Américanistes* 10:117–119.

Hough, W.

1926 *Fire as an Agent in Human Culture.* Smithsonian Institution, U.S. National Museum Bulletin 139. Washington, D.C.: U.S. Government Printing Office.

Humphrey, R. R.

1958 The Desert Grassland: A History of Vegetational Change and an Analysis of Causes. *Botanical Review* 24:193–252.

1974 Fire in the Deserts and Desert Grassland of North America. In *Fire and Ecosystems,* edited by T. D. Kozlowski and C. E. Ahlgren, pp. 365–400. New York: Academic Press.

Kay, C. E.

1994 Aboriginal Overkill: The Role of North Americans in Structuring Western Ecosystems. *Human Nature* 5:359–398.

Kaye, M., and T. W. Swetnam

1999 An Assessment of Fire, Climate and Apache History in the Sacramento Mountains, New Mexico. *Physical Geography* 20:305–330.

Lewis, H. T.

1973 *Patterns of Indian Burning in California: Ecology and Ethnohistory.* Anthropological Papers No. 1. Ramona, California: Ballena.

1980 Indian Fires of Spring. *Natural History* 89 (January 1980):76–83.

1985 Why Indians Burned: Specific Versus General Reasons. In *Proceedings–Symposium and Workshop on Wilderness Fire,* tech. Coord. J. E. Lotan et al., pp. 75–80. General Techical Report INT-182. Ogden, Utah: USDA Forest Service.

MacCleery, D.
1994 Understanding the Role the Human Dimension Has Played in Shaping America's Forest and Grassland Landscapes. Is There a Landscape Archaeologist in the House? Eco-Watch; available at www.lib.duke.edu/forestusfscoll/landscapes. htm

Moir, W. H.
1982 Fire History of the High Chisos, Big Bend National Park, Texas. *Southwestern Naturalist* 27:87–98.

Pase, C. P., and C. E. Granfelt, tech. coord.
1977 *The Use of Fire on Arizona Rangelands.* Arizona Interagency Range Committee Publication no. 4, Phoenix.

Pyne, S. J.
1984 *Introduction to Wildfire.* New York: John Wiley and Sons.
1995 *World Fire: The Culture of Fire on Earth.* Seattle: University of Washington Press.
1997 *Fire in America: A Cultural History of Wildland and Rural Fire.* Seattle: University of Washington Press.
1954 Forest and Grass Burning in the Mountain West. *Southwestern Lore* 20:42–46, 59–64.
1955 Forest and Grass Burning in the Mountain West. *Southwestern Lore* 21:5–8.

Swetnam, T. W., C. H. Baisan, P. M. Brown, and A. C. Caprio
1989 Fire History of Rhyolite Canyon, Chiricahua National Monument. Unpublished manuscript prepared for the National Park Service, Southern Arizona Group Office [contract PX 8601-7-0106], Phoenix.

Swetnam, T. W.
1990 Fire History and Climate in the Southwestern United States. In *Effects of Fire Management of Southwestern Natural Resources,* tech. coord. J. S. Krammes, pp. 6–17. General Technical Report RM-191. Fort Collins, Colo.: USDA Forest Service.

Stewart, Omer C.
1956 Fire as the First Great Force Employed by Man. In *Man's Role in Changing the Face of the Earth,* edited by W. L. Thomas, Jr., pp. 115–133. Chicago: University of Chicago Press.

Weaver, H.
1968 Fire and Its Relationship to Ponderosa Pine. In *Proceedings—Tall Timbers Fire Ecology Conference,* pp. 127–149. No. 7. Tallahassee, Florida: Tall Timbers Research Station.

Williams, G. W.
2000 Introduction to Aboriginal Fire Use in North America. *Fire Management Today* 60:8–12.

Wright, H. A., and A. W. Bailey
1982 *Fire Ecology*. New York: John Wiley and Sons.

APPENDIX 1. PROJECT BUDGET, PHASE II

This is the second and concluding phase of the review and synthesis of *unpublished, archival information* on historic fire use management practices among Anglo, Hispanic, and American Indian communities in Arizona and New Mexico and the extreme western portions of the Texas and Oklahoma Panhandles in the area of the Kiowa and Rita Blanca National Grasslands.

This budget reflects *Recommendations for Further Research* (see pp. 37–39 above).

The following items of work can be performed over a period of approximately six to eight months beginning in March 2004.

Archival Research: 320 hours (40 days) at $50 per hour:	$ 16000
(Consultant will contribute an additional 41 hours at $50 per hour)	
Travel	
Albuquerque, New Mexico	
720 miles (6 round trips) at $.32 per mile:	$231
per diem (6 days of 12 hours but less than 24 hours at $22.50):	$135
Denver, Colorado (one visit)	
National Archives, Rocky Mountain Region	
780 miles, at $.32 per mile:	$250
per diem (6 days at $85 per day):	$510
Tucson, Arizona	
Air fare:	$160
Car rental:	$175
per diem (6 days at $85 per day):	$510
Austin, Texas	
Air fare:	$325
Car rental:	$175
per diem (6 days at $85 per day):	$510
Norman, Oklahoma	
Air fare:	$280
Car rental:	$100
per diem (5 days at $85 per day):	$425
Washington, D.C. (National Archives)	